

IMPROVING SCREENING FOR BREASTFEEDING DIFFICULTY AND ASSESSMENT OF  
LABIAL AND LINGUAL FRENULUM-TIES IN BREASTFEEDING INFANTS DURING  
THE PEDIATRIC VISIT

Caitlin Rafter D'Alonzo

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### Dedication

This project is dedicated to my parents, brothers, husband, and kids who encourage growth through higher education, involvement in community and global health, and my continuous quest to diagnose any and all pediatric ailments.

### Abstract

The correlation between breastfeeding difficulty and labial (lip) and lingual (tongue)-tie has recently been a controversial topic with focus on treatment concerns. The focus should be redirected to standardized identification of breastfeeding difficulty and assessment for frenulum tethers as a cause for infants during pediatric office visits. In order to meet American Academy of Pediatrics and U.S. Preventative Task Force recommendations to exclusively breastfeed infants up to at least 6 months of age, a project was designed to encourage standardized inquiry and education about breastfeeding and potential tongue/lip-tie during the highly influential outpatient pediatric visit (AAP, 2015; U.S. Preventative Task Force, 2016). This project introduces clinical guidelines comprised of breastfeeding difficulty screening questions, lingual/labial frenulum assessment tools, and treatment recommendations for use by providers in a private pediatric clinic. Methods for educating and implementing new guidelines with practitioners included educational sessions with visual and descriptive tools, and interdisciplinary instruction with Lactation Consultants and Otorhinolaryngologists (ENT). Participants included private and government-funded paying families with breastfed infants in an urban pediatric clinic over the course of 3 months. Data analysis was collected during weekly medical record audits. There were a total of 109 breastfeeding infants screened or examined for frenulum tie. There was an increase in breastfeeding difficulty screening. In conclusion, after evaluation it was determined that dissemination of current literature regarding how best to screen for breastfeeding difficulty and, in response, recognize, assess, and repair tongue and lip-tie in infants experiencing breastfeeding difficulties increases standardization and consistency of screening as well as awareness of tongue/lip-tie as a contributor to breastfeeding difficulty.

*Keywords: breastfeeding, breastfeeding difficulty, breastfeeding difficulty screening, labial frenulum, lingual frenulum*

## Table of Contents

Acknowledgments.....	2
Dedication .....	3
Abstract .....	4
Chapter One: Overview of the Problem of Interest .....	9
Background Information .....	9-11
Significance of Clinical Problem .....	11-13
Question Guiding Inquiry (PICO) .....	13-15
Population .....	13
Intervention .....	13-14
Comparison .....	14
Outcome(s).....	15
Summary .....	15
Chapter Two: Review of the Literature Evidence .....	16
Methodology .....	16-17
Sampling strategies .....	17
Evaluation criteria .....	17
Literature Review Findings.....	17-21
Limitations of Literature Review Process.....	21
Discussion .....	21-22
Summary .....	23
Chapter Three: Theory and Concept Model for Evidence-based Practice .....	23-24
Concept Analysis .....	24-26
Theoretical Framework .....	26-27

Application to practice change.....	27-28
Evidence-Based Practice Change Theory .....	29-30
Application to practice change.....	30-31
Summary .....	31
Chapter Four: Pre-implementation Plan .....	31-32
Project Purpose .....	32
Project Management .....	32
Inter-professional collaboration .....	32-33
Risk management assessment .....	34-35
Organizational approval process.....	35
Information technology.....	35
Cost Analysis of Materials Needed for Project.....	35-36
Plans for Institutional Review Board Approval.....	36
Plan for Project Evaluation .....	36
Demographics .....	36
Outcome measurement.....	36-37
Evaluation tool .....	37
Data analysis .....	37-38
Summary .....	38
Chapter Five: Implementation Process .....	39
Setting .....	39-40
Participants.....	40
Recruitment.....	41
Implementation Process .....	41-43

Plan Variation .....	44-46
Summary .....	46-47
Chapter Six: Evaluation of the Practice Change Initiative .....	47
Participant Demographics .....	47
Intended Outcomes .....	47-48
Findings .....	49-52
C1. Screening Results Graph .....	49
C2. BTAT Utilization Graph .....	50
C3. Murphy Manuever Utilization Graph.....	51
C4. Referrals Made Graph.....	52
Summary .....	52-53
Chapter Seven: Implications for Nursing Practice.....	53
Practice Implications.....	53-54
Essential I: Scientific underpinnings for practice .....	54-55
Essential II: Organization and systems leadership for quality improvement and systems thinking .....	55-57
Essential III: Clinical scholarship and analytical methods for EBP .....	57-58
Essential IV: Information systems/technology and patient care technology for the improvement and transformation of healthcare.....	58-59
Essential V: Healthcare policy for advocacy in healthcare .....	59-60
Essential VI: Interprofessional collaboration for improving patient and population health outcomes.....	60-61
Essential VII: Clinical prevention and population health for improving the nation's health .....	61-62
Essential VIII: Advanced nursing practice .....	62-63
Chapter Eight: Final Conclusions .....	64

Significance of Findings .....	64-65
Project Strengths and Limitations .....	65-66
Project Benefits .....	67
Recommendations for Practice .....	67
Final Summary .....	67-68
References .....	69-71
Appendix A: Breastfeeding Screening Clinical Guideline .....	72
Appendix B: Chart Audit Tool .....	73
Appendix C: Chart 1: Number of Charts Reviewed.....	74
Chart 2: Post-BTAT Scoring Recommendations.....	74



## **Chapter One: Overview of the Problem of Interest**

In the last decade a movement for breastfeeding as the primary source of sustenance for newborns through infancy has engrossed our national health care system. This movement was in response to evidence showing that breastfeeding enhances childhood immunity, growth, and bonding between the mother and child. This evidence has been widely published and has influenced the recommendations of the World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC), and American Academy of Pediatrics. Education by health care staff plays a large role in the success of mothers attempting breastfeeding (Bass, 2015). In particular, the staff who are in contact with the infants are lactation specialists, pediatric nurses, and pediatric clinicians who should all be knowledgeable resources for mothers learning to breastfeed. Between 0.02% and 10.7% of infants are found to have anterior, posterior tongue-tie (ankyloglossia or AG), and/or lip-tie (labial frenulum tie) that can significantly inhibit the ability to breastfeed. AG and lip-tie can lead to poor suckling, painful latching, and early discontinuation of breastfeeding (Walsh & Tunkel, 2017). The purpose of this chapter is to discuss the importance of early assessment and intervention of AG and lip-tie by pediatric providers for infants experiencing breastfeeding difficulty, dysphagia, reflux, and/or failure to thrive related to one or both of these anomalies.

### **Background**

The United States (U.S.) Department of Health and Human Services (USDHHS) made increasing the percentage of infants breastfed to 81.9% a national objective in the Healthy People 2020 initiative (Department of Health and Human Services, 2017). Since 2016 the national initiation rate of breastfeeding has risen to 81.1%, almost meeting the Healthy People goal, however, the percentage of women still breastfeeding at 6 months is 22.3% (AAP, 2018). This disparity is indicative of the obstacles encountered during breastfeeding and lack of advocacy.

Considering the U.S. is a highly developed country with resources and opportunity for information assimilation the vast majority of neonates and infants should be breastfed to at least 6 months of age in response to these recommendations. As mothers are being encouraged to breastfeed when they begin their antenatal care, there is little to no way to anticipate how successful the process will be once the baby is born. Pediatric clinicians are the first-line of education for mothers during the first visits after birth when the neonate (hereafter included in infant) or infant is developing quickly.

The American Academy of Pediatrics (2018) recommends that newborns be seen by their pediatrician within the first 3-5 days of life. This is a crucial time to determine how well an infant is latching, suckling, and digesting, and is an opportunity for the pediatrician to encourage breastfeeding and to emphasize its importance (American Academy of Pediatrics, 2018). This visit allows the infant to be assessed for anatomical developments following birth and the mother to ask questions about nutritional intake including breastfeeding. For populations where the majority of mothers are more familiar with formula feeding, due to cultural practices or past experiences, breastfeeding education and encouragement are vital for breastfeeding attempts to be successful.

Canadian Agency for Drugs and Technologies in Health (2016) stated that frenulum ties are not often assessed for if there is no breastfeeding assessment tool completed by the mother. Walsh & Tunkel (2017) found a positive correlation between using a breastfeeding assessment tool and grading frenulum ties, which assisted with clinical decisions on intervening with frenotomy. Literature is sparse in discussing lip-tie as it is more likely to resolve spontaneously with normal facial growth. However, if the maxillary frenulum is noted to connect the lip to the bottom of the upper gums it is likely to cause breastfeeding difficulty, possibly speech development problems, and/or orthodontic misalignment (Pransky, Lago, & Hong, 2017).

Current literature does emphasize that appearance is not enough to diagnose tongue or lip-tie, though. An evaluation of function with the Bristol Tongue Assessment Tool (BTAT) in regard to breastfeeding success, growth, and proper development along with a visual examination assists with determining whether or not to treat tongue and/or lip-tie (Walsh & Tunkel, 2017). For many mothers, if the newborn or infant appears to be breastfeeding well enough to gain weight, or does not show obvious signs of breastfeeding difficulty, they may not know to discuss other signs of breastfeeding difficulty such as ulcerated nipples and infant reflux with the provider. It was recommended through this project proposal that a local pediatric practice ask three questions regarding latch, suckling and nipple trauma to initiate discussion about breastfeeding success. If any of the questions were indicative of difficulty the provider was then advised to utilize the BTAT up until infants were 6 months of age, at which time the mother would likely have ceased breastfeeding if difficulties were present and unresolved. Providers were encouraged to use the BTAT to guide a thorough tongue assessment, as well as the murphy maneuver to assess for posterior tongue tie if there were any concerns about breastfeeding success. Assessing for tongue and lip-tie and referring for repair during the first few months of life in response to breastfeeding difficulties or failure to thrive has a notably high benefits-to-risk ratio, involving a low-to-no-cost assessment and quick turnaround time for beneficial effectiveness.

### **Significance of Clinical Problem**

The lingual frenulum is a midline piece of flesh connecting the tongue to the floor of the mouth. The definition of ankyloglossia (AG) used to be based solely on the anatomic description of a thickened and/or shortened frenulum from the tip of the tongue or from the posterior of the tongue that restricted movement. However, the more recent literature is beginning to describe AG based more on the type of restriction that is caused by a thickened, shortened, and/or

distally-connected frenulum (Walsh & Tunkel, 2017). If left undiagnosed and untreated a lip - tie and/or anterior or posterior lingual frenulum-tie has been shown to decrease the ability to effectively latch, swallow, and develop proper speech (Pransky, Lago, & Hong, 2015).

Similarly, the labial frenulum is tissue that connects the inner upper lip to the upper maxilla. If this tissue is shortened, thickened, or extends to the base of the maxilla it can restrict upper lip movement and prevent proper sucking as an infant and/or create an enlarged space between upper incisors when primary teeth come in (Pransky, et al, 2015). However, there is much controversy in pediatric and ENT practice regarding the assessment, diagnosis, and treatment of lingual and labial frenulum-ties due to insufficient studies on short-term and long-term effects and benefits of frenotomy (also known as frenulotomy or frenectomy), the surgical release (cutting) of a frenulum.

Pransky and associates (2015) found that the labial frenulum can lengthen on its own with normal infant/child growth and development but at this time there is no way to determine whether it will lengthen or remain tethered. Frenulum assessment and recognition of tethering is becoming a more widely researched topic considering that frenulum-ties of significance have an association with breastfeeding difficulty leading to decreased mother-child bonding, increased stress, and possible post-partum depression; early cessation of breastfeeding limiting nutritional and immunological support; reflux of ingested milk or formula which can cause failure to thrive; childhood speech development difficulties; and orthodontic challenges (Pransky, et al, 2015; Walsh & Tunkel, 2017; Hill & Ruggiero, 2017).

With little prior literature or clinical practice guidelines to follow, pediatric clinicians are left without much evidence and guidance as to assessment, diagnosis, and treatment of patients in regard to labial and lingual frenulum-ties. This lack of guidance allows for many missed opportunities for proper assessment and ruling in or out of this anomaly in relation to

breastfeeding difficulty, infantile reflux, failure to thrive, and later in childhood, speech difficulty.

### **Question Guiding Inquiry (PICO)**

How many infants are experiencing difficulty breastfeeding, reflux, or failure to thrive because of problematic latching or swallowing due to an unevaluated tethered lingual or labial frenulum?

### **Population**

The targeted population included all breastfeeding infants within the first six months of life who visited the local pediatric clinic or its two satellite clinics for acute visits or well-child visits for ongoing or current complaints of breastfeeding difficulty, infantile reflux, or failure to thrive. The odds are higher for breastfeeding exclusively, or in conjunction with supplementation, with a proper assessment, diagnosis, and treatment plan involving frenotomy for labial and/or lingual frenulum-tie, preferably prior to the first 6 months of life, but within the first year of life (AAP, 2017). Neonates who underwent frenotomies in the first 30 days of life have been shown to have a slightly higher breastfeeding score reported by their mother after the procedure compared to infants older than 30 days (Sharma & Jayaraj, 2015).

### **Intervention**

Providers at this local pediatric office were advised to assess the oral cavity of symptomatic infants to evaluate whether the tongue protruded past the lower gum line, dimpled with protrusion, and/or had a heart-shaped tip during protrusion. If the infant cries it makes the exam easier due to the ability to watch the tongue move (Walsh & Tunkel, 2017).

Symptomatic infants without any of the previously described signs upon examination of the oral cavity were to receive the murphy maneuver exam. The murphy maneuver is a quick

oral palpation and visualization exam which helps to identify tight, shortened posterior frenulum tethering (Hill & Ruggeiro, 2017).

It was recommended that clinicians at the pediatric office institute the use of a breastfeeding assessment tool such as the Hazelbaker Assessment Tool for Lingual Frenulum Function (HATLFF), or its abridged version, the above-mentioned Bristol Tongue Assessment Tool (BTAT). Both have been tested and validated in measuring and diagnosing frenulum ties. These tools have been reported as more time-intensive for providers and staff but are effective in assisting with an uncertain assessment or diagnosis. Both tools measure tongue function and appearance. The BTAT was found to be more reproducible in comparison to the extensive HATLFF, with a provider report of increasing confidence in evaluation, diagnosis, and treatment decisions. If AG or lip-tie was diagnosed and the infant was symptomatic, literature recommends frenotomy as the most effective and efficient treatment.

If pediatric providers collaborated with a local Ear, Nose, and Throat surgeon to train in the in-office local anesthesia frenotomy procedure for infants who would otherwise be referred to ENT, they could provide continuity of care, more cost-effective visits for parents/guardians, and potentially increase billable services for their practice.

### **Comparison**

Due to the inconsistent practice and insufficient evidence prior to the resurgence in breastfeeding, providers have not known whether the benefits outweigh the risks to intervene with a labial and/or lingual frenulum. Without lactation consultants in each pediatric office, pediatricians need to be efficient in educating about breastfeeding in order to help mother and baby prosper from breastfeeding benefits. Infants seen in the pediatric office with complaints of difficulty breastfeeding, unresolved regurgitation or reflux, and or failure to thrive are sometimes treated with a variety of therapies such as incorporating nipple shields, supplementing with

formula despite the risk that they will no longer take the breast, switching to formula, prescriptions for medications for reflux such as H2-blockers and PPIs, radiographs for GI images, allergy testing, and further studies. These tests and therapies are not wrong, but can become costly and time-consuming, and in the case of supplementing with or switching to formula without necessity are not best practice for these patients.

### **Outcomes**

Desired outcomes for this project are standardization of breastfeeding education, support, and assessment for breastfeeding mothers at each infant visit up to 6 months of age using the BTAT tool with interpretation by pediatric providers after proper training with BTAT by project director with lactation consultation support. A second outcome is to increase oral examination for tongue and lip-tie on infants with breastfeeding difficulties up to 6 months of age, with symptoms including breastfeeding difficulties, unresolved reflux, and/or failure to thrive.

### **Summary**

Clinicians at the clinic who saw infants with breastfeeding difficulty or sequelae such as reflux or failure to thrive were to have assessed the oral cavity for signs of lingual and/or labial frenulum tethering/ties. If there were no observable tongue anomalies determined by observation and use of the BTAT, the murphy maneuver involving examination of the underside of the tongue with the index finger, should have been performed. If an infant were symptomatic but the pediatric provider did not feel confident with a diagnosis of tongue or lip-tie after assessment with BTAT and murphy maneuver, a referral to lactation consulting in the local hospital was advised as the next step of therapy prior to or along with any other pertinent therapies consistent with symptoms, such as H2-blocker for reflux or supplementing with formula for significant weight concerns. If a lip or tongue-tie were determined to be a cause of symptoms by the history of present illness, BTAT scores less than 4, murphy maneuver, and/or

visualization of a shortened or thickened frenulum, an in-house frenotomy by a trained pediatric provider or ENT clinician was recommended with immediate breastfeeding assessment to follow. These steps in evaluating and determining treatment are low-cost, minimally-invasive, time-effective, and have been proven to have a favorable benefit-to-risk ratio. Several reports have been published in the past few years affirming this pediatric oral anomaly is worth assessing and treating early in regard to breastfeeding abilities with the hope of improving breastfeeding rates through at least 6 months of age.

## **Chapter Two: Review of the Literature**

In order for clinicians to provide the best practice for patients they need to utilize literature on evidence-based practice (EBP). For topics that are not widely discussed or researched there is an ongoing struggle with standardizing care. However, with the initiative to increase breastfeeding on a global and national level, discussions and research on the various factors that hinder effective breastfeeding have been increasing in number and validity. Implementing the Bristol Tongue Assessment Tool (BTAT) for breastfeeding mothers along with educating the staff and pediatric providers of a local pediatric clinic on how to effectively assess for tongue and/or lip-tie are ways to reduce breastfeeding difficulty and determine whether intervention with frenotomy is ideal. The purpose of this chapter is to review and discuss the current literature on ankyloglossia, lip-tie, their effects, and recommendations on interventions.

### **Methodology**

An electronic literature search was systematically performed using CINAHL Complete, EBSCOhost, Medline Plus, and Cochrane databases through the ECU libraries website. The publication date range was set to January 2014 to 2018, content type was “Any”, and discipline was “Any”. The language was set to English and Show Only was set to “Items with full text



online” and “Scholarly materials, including peer-reviewed”. Search modes were left in default and the phrase “ankyloglossia untreated” produced mostly older publications about the diagnosis, treatment, or results untreated; but also produced two more recent studies by Pransky, Lago and Hong in 2015 and the Canadian report for clinical guidelines (2016). One word, “frenectomy”, produced several articles, mostly related to breastfeeding and ENT intervention in infancy. The last productive search was “tongue tie and breastfeeding” which resulted in two articles and one random control trial (RCT) since 2014. Inclusion criteria were infancy (younger than 1-year-old) and having breastfed at some point during infancy. Ultimately, the number of articles used for the literature review totaled seven. Those seven included one retrospective chart review, one clinical guideline review, one retrospective research review, one retrospective study of 4 RCTs, one subjective review, one review of clinical tool usage, and one case study.

### **Literature Review Findings**

The literature on neonates and infants with labial and lingual frenulum-ties was substantial. However, a major portion of this literature was 5 years old or older, controversial in relation to breastfeeding difficulty, or involved small cohort sizes. Throughout the current literature frenulum ties were discussed in relation to breastfeeding and how to diagnose. Of the seven articles, each recognized a positive correlation between AG treated with frenotomy with reported breastfeeding improvement. However, the literature was not in agreement on frenotomy as the only recommendation in response to diagnosis of AG or lip-tie.

These various reports and reviews looked at the correlation between diagnosed frenulums treated with frenotomies and the resulting improved breastfeeding reports. Over a one-year period, Pransky, Lago, & Hong (2015) looked at the detection of ankyloglossia and lip-tie in a high-volume breastfeeding difficulty clinic where babies with either or both of these anomalies were referred for frenotomies, the surgical release of the frenulum tie. This study reviewed the

effects of frenotomies on breastfeeding ability for mothers trying to exclusively breastfeed. Out of a total of 618 patients in the medical records, 490 had anterior ankyloglossia, 120 posterior, and 14 upper lip-tie. All of these patients underwent a frenotomy and recovered without difficulty. Improved breastfeeding was reported by 78% of anterior repair patient mothers, 91% posterior repair patient mothers, and 100% labial repair patient mothers. A strong correlation between breastfeeding difficulty and frenulum ties was found but there are also other factors causing difficult breastfeeding that were not measured (Pransky, Lago, & Hong, 2015).

A separate retrospective analysis of research conclusions on infants younger than 3 months who had experienced breastfeeding difficulty and undergone frenotomy repair found positive correlation with short-term breastfeeding results, but a lack of evidence proving long-term positive outcomes from the repair (Power & Murphy, 2015). This review stated that the largest analyzed systematic review of effects of frenotomy on breastfeeding concluded there were not enough quality studies. The review emphasized the importance of a good assessment, preferably with the Hazelbaker Assessment Tool measuring lingual function (HATLFF), prior to referring for frenotomy due to the lack of evidence proving long-term effects (Power & Murphy, 2015). Recommendations are to assess thoroughly, if breastfeeding difficulties are subjectively or objectively significant and the HATLFF results are indicative of decreased lingual function, to refer to a qualified professional for frenectomy within 2-3 weeks' time (Power & Murphy, 2015).

A small study conducted by Sharma and Jayarai in 2015 discussed breastfeeding difficulty and the correlation to improvement with frenotomy. The Infant Breastfeeding Assessment Tool was used to question mothers over the phone pre-intervention with frenotomy and 1-month post-intervention with infants diagnosed with ankyloglossia. There were 54 infants and mother involved in the study with a 78% ultimate participation rate by the mothers. There was a surgical group and non-surgical group, with 81% of mothers reporting improved

breastfeeding post-intervention in the surgical group, and 17% of mothers reporting improved breastfeeding in the non-surgical group. The age of those who underwent frenotomy was reviewed as well, and for those 30 days old or less 94% of mothers reported breastfeeding improvement. In infants older than 30 days 68% of mothers reported breastfeeding improvement. This study concluded that frenotomy is a safe and effective intervention that improves breastfeeding in most cases and best practice is to perform at 30 days old or less (Sharma & Jayaraj, 2015).

In a review of clinical guidelines that did not argue for frenotomies as a first-line intervention the Canadian rapid response report was a document assessing the most current literature on frenulum-ties, frenotomies, and effects on breastfeeding. Providing critical appraisal for the clinical guidelines about frenulum ties and frenectomy repair studies between the UK and USA the studies were reviewed on the relationship between labial and lingual ties and objective breastfeeding reports (CADTH, 2016). Though the report states there appear to be no standard clinical practice guidelines (CPGs) for determining whether lingual or labial tie is present and how to treat if so, it goes on to say breastfeeding difficulty is a multi-factorial process that is not commonly solved by frenotomy alone. The review reports assessment for a shortened frenulum does not normally occur unless providers react to poor breastfeeding questionnaire scores from the LATCH (Latch on, Audible swallowing, Type of nipple, Comfort, and Hold position) and IBFAT (Infant Breastfeeding Assessment Tool) tools with an oral assessment of the newborn. It also suggests the intervention of referring to an Ear Nose and Throat (ENT) specialist or another qualified provider if there is questionable shortening of a frenulum. It was determined there is a positive correlation between improved objective breastfeeding scores and frenotomies (CADTH, 2016).

A lengthy case study that stands alone from other discussed studies is relevant because of the commonality of the reflux diagnosis assumed due to presenting symptoms. The article describes a male infant diagnosed with reflux in response to his initial presentation, discusses the process of testing, treatment, and diagnosis of this patient over the course of 5 months, and the lack of systematic reviews assessing AG in pediatric primary care settings. This study by Rebecca Hill and Kristine Ruggiero (2017) follows a bottle-fed premature infant who underwent formula changes and medication therapy for reflux for 5 months prior to being diagnosed with ankyloglossia.

His symptoms of increased gas, prolonged feeding times, weight loss, inability to hold a pacifier in his mouth, and falling asleep during feedings did not improve with switching formulas to soy-based then amino acid-based formula. He had a positive guaiac test and was diagnosed with milk/soy protein intolerance. His next guaiac was negative, but weight was not improving and symptoms were still present. An obstruction was excluded along with pyloric stenosis due to review of symptoms and lack of evidence during physical examination. No jaundice was diagnosed at any stage. The infant was sent to a gastroenterologist after the 1-month check-up and the formula was switched again and the H2 agonist was switched. His symptoms continued and at 2 months his weight had dropped. He was also on a PPI and seeing his PCP along with GI. The patient was at 7.5% for weight at his 4-month check-up and was referred for a frenotomy due to a confirmed tongue-tie found during the Murphy maneuver along with upper lip-tie and symptoms improved with 48 hours of the intervention. The patient was weaned from medications prior to 5.5 months of age and was asymptomatic within 2 weeks of frenotomy (Hill & Ruggiero, 2017).

One article specifically outlined two tools developed for use in oral assessment and their functionality in office settings. The implementation of the Hazelbaker Assessment Tool for

Lingual Frenulum Function (HATLFF) was compared with a developed abridged version that continued to assess evaluate lingual function less time. The Bristol Tongue Assessment Tool (BTAT) was used for 224 assessments by midwives in practice with neonates. The BTAT was found to be reproducible after teaching to each other, was positive for consistency of use, and when compared to the HATLFF, had 0.89 significant correlation results in tongue evaluation, showing it was as effective as the HATLFF in detection of tongue-tie. The BTAT was determined by subjective and objective measurements to be a more efficient tool in practice for assessment and diagnosis of tongue-tie than HATLFF (Ingram, Johnson, Copeland, Churchill, Taylor, et al. (2015).

Finally, one review discussed the importance of consistency of practice and classification in primary care and ENT in order to produce accurate diagnoses and results for AG in newborns and infants. This review stated AG is a growing concern and yet there are significant variations in medical practice and studies that assist with guiding clinicians to a more effective evidence-based practice. The recommendation for consistently using the Hazelbaker Assessment Tool for Lingual Frenulum Function and Coryllos grading system were made in order to improve quality of research and assist with making a definitive diagnosis (Walsh & Tunkel, 2017).

### **Limitations of Literature Review Process**

The lack of systematic reviews and randomized control trials were notable in searching for reliable literature. Studies on ankyloglossia that was diagnosed, untreated, and contributed to various sequelae had not been conducted and/or published at the time of the literature search. Also, sample sizes throughout current literature were typically less 500 participants, with exception of one study, which tends to allow for less significant results. Also, lack of consistency of terminology for tongue-tie, labial-tie, and surgical release made it difficult to

search thoroughly. There was a notable lack of current literature on this topic, especially on the long-term effects of intervention.

### **Discussion**

In the review of literature on ankyloglossia (AG), lip-tie, breastfeeding, and the intervention there was a consistent theme of uncertainty about determining diagnosis and long-term effects of AG and lip-tie in children. However, there was also a consistent conclusion that surgical intervention with frenotomy for functionally limited infants with signs of tongue and/or lip-tie improved breastfeeding ability in the majority of infants. The literature discussing tools for assessment consistently cited the HATLFF tool as a subjective measuring guide while also citing reports that this particular tool as difficult to implement in practice due to time constraints and low reproducibility. The Bristol Tongue Assessment Tool (BTAT) was reported to be comparable in effectiveness of measurement of lingual function and would be a more likely-to-be-used tool in a busy practice with several varying clinicians. The proposed intervention after reading this literature was to assist pediatric clinicians in providing consistent assessment and evaluation of AG and lip-tie for any infant under 6 months of age presenting with difficulty breastfeeding using the BTAT and digital tongue examination called the Murphy maneuver. When and if the BTAT measurements did not provide conclusive information in regard to tongue-tie, the clinician could then use the Murphy maneuver to assess for the less visually obvious posterior tongue-tie. If either tool confirmed positive results for a tongue-tie, the provider would have valid support for a referral to ENT or in-office pediatric provider trained to perform frenotomy.

The advantages of this literature review have been an improved understanding of the lack of awareness and evidence of AG and lip-tie as a significant problem affecting short-term and long-term development for children, specifically breastfeeding success. Across the board, the

literature stated there have not been enough comprehensive studies to show tongue and/or lip-tie short-term relation to/lack of relation to breastfeeding, and long-term relation to dentition, speech development, and reflux.

Disadvantages of the literature were the lack of definitive recommendations from extensive research. The dissemination of evidence was slowly occurring and the increased interest in this topic was then growing, so more research is likely underway. However, the current state of breastfeeding as a priority warrants a more thorough look into causes for breastfeeding difficulty, especially basic oral development involvement.

In order to share the information gained from this literature review with the pediatric clinicians at the local pediatric practice there were hardcopy summaries of the literature provided to each provider, laminated copies of the BTAT placed in each patient room, and education and simulation provided on the Murphy maneuver. Also, ENT collaborated with interested providers in learning the in-office surgical intervention of frenulum release.

### **Summary**

Literature and practice portrayed a gap in knowledge about the assessment and diagnosis of lingual and labial-ties in infancy. In the local pediatric clinic there was little discussion about how to assess or when to refer for this anomaly due to this lack of knowledge. However, due to controversial literature questioning whether frenectomy is really warranted, and the challenge of answering that question definitively, implementation of better assessment, diagnosis, and treatment is a large feat. Though, with the more current reviews on the topic coming to a general consensus that the benefits of frenotomies outweighed the risks for infants with symptomatic breastfeeding difficulties, this practice is worth implementing in order to assist successful breastfeeding campaigns.

### **Chapter Three: Theory and Concept Model for Evidence-based Practice**

In an established pediatric practice where the providers have many years of pediatric practice experience between them, it is uncommon to introduce a new examination technique and idea. Though nuances of practice change constantly due to current information and evidence-based practice (EBP), there is not often a chance to practice performing new skills or vocalizing new information prior to dissemination to patients. Also, most EBP is information that providers are discovering and sharing amongst themselves by reading current literature. The providers at the local pediatric clinic were not accustomed to a nurse or clinician coming into their practice and recommending they perform a new or more thorough examination to their patients in order to enhance patient outcomes. A group effort led by the project director and project champion was implemented to create buy-in and support for a change in practice. The NLN Jeffries Simulation Theory was used by the project director to teach new methods because of its effectiveness in providing increased confidence and engagement through practice with peers prior to individual implementation with patients (Jeffries, Rodgers, & Adamson, 2015).

#### **Concept Analysis**

As a major pediatric practice in a small city with two satellite offices in small towns, these pediatric providers' impact on the health and quality of lives of many children and families was significant. It was imperative that this practice embrace current and effective practice standards, especially for breastfeeding mothers and infants, as a priority for their practice and for the community. Implementation of a tongue assessment tool and examination detecting ankyloglossia and lip-tie was expected to have a positive impact on the services provided to the community by this practice. With the goal of conducting a successful implementation for this practice the NLN Jeffries Simulation Theory was chosen to guide the practice change. This



theory discussed the benefits of providers simulating new skills understanding with peers in a learning environment.

Clinicians, parents, and community members alike should be aware of the health impacts breastfeeding provides as well as the challenges that may come about during breastfeeding. Breastfeeding is the act of providing nourishment by feeding directly from the breast with the milk of lactating mothers. This act is how mothers fed their children long before formula and other substitutes were introduced as comparable nourishment. As the World Health Organization (WHO, 2018) states, breastfeeding with breastmilk is the natural way of providing nutrients to young infants. The colostrum, or the initial thickened, yellowish breastmilk produced by the mammary (breasts) after childbirth is the "perfect food" for infants and provides a wealth of antibodies and natural supportive qualities that the mother's body has created (World Health Organization, 2018).

Though most people know what breastfeeding is, there is a lack of understanding of the rich nutrients and benefits it provides infants. Clinicians should be aware of the benefits and also of the challenges many mothers face while attempting to breastfeed. Educating clinicians about the Bristol Tongue Assessment Tool that asks mothers questions about latch, pain, suckling, and tongue movement was expected to help providers and mothers decipher if infants were experiencing pathological breastfeeding complications or positional difficulties. Teaching clinicians how to perform the Murphy maneuver by placing the infant on their lap with a knee-to-knee to parent position while sweeping under the infant's tongue with a gloved index finger to feel for tongue-tie under the floor of the mouth was expected to give providers another tool for assessing tongue mobility. Then they would decipher between physiologic tongue-tie, or ankyloglossia, and other causes of poor breastfeeding. Ankyloglossia is simply the shortening and/or thickening of the skin at the base of the tongue that attaches to the floor of the mouth.

The tightness of this tissue can be a determining factor in successful breastfeeding and should always be assessed for, along with lip-tie, in breastfeeding infants.

Applying the NLN Jeffries Simulation theory in the education of clinicians at a local pediatric clinic would mean preparing them and giving them time to digest and get on-board through discussion and review of the Bristol Tongue Assessment Tool (BTAT) questionnaire, using the Murphy maneuver to palpate for frenulum ties, and asking questions about the potential findings. The providers would then be able to implement the new techniques with a sense of preparedness that would convey confidence and purpose to patients and parents.

### **Theoretical Framework**

The NLN Jeffries Simulation Theory was developed with the undergraduate nursing student in mind (Jeffries, 2015). The idea Pamela Jeffries had was that students could practice the movements, thought-process, and skills during simulation and gain confidence in their application of practice, through non-stressful simulation scenarios (Jeffries, 2015). Jeffries (2015) calls the provider response and willingness to change part of the “participant response”, which is crucial for this project since the practice changes would affect the clinicians on a daily basis after implementation. If the practitioners believe the new tools and skills would help their patients and not significantly increase the time required for appointments or the schedule, they would be more likely to advocate for this change which would ultimately propel a change in culture in the community towards better pediatric health practices (Jeffries, et al., 2015).

In review of nursing students learning how to interact with Autism Spectrum Disorder (ASD) patients there was much feedback from the students about the ability to critically think and problem-solve during a clinical simulation experience (Mcintosh, Thomas, Andrews, 2018). The students reported increased confidence in this setting after practicing how to ask certain questions in a certain manner, and how to provide comfort through body language as they

practiced with standardized patients prior to interacting with patients with diagnosed ASD (Mcintosh, et al., 2018).

Similar to these students who were preparing to help those who needed guidance and comfort, teaching with simulation at the clinic would instill confidence for the pediatric providers to practice the knee-to-knee Murphy maneuver oral examination and discussion of BTAT results alongside each other and their clinical staff in a setting meant for learning prior to applying the practice to patients and parents (Jeffries, Rodgers, & Adamson, 2015). The concept of the NLN Jeffries Simulation Theory is to provide an interactive, guiding environment that is collaborative, enjoyable, and equipped with answers for any questions that may arise. This environment should allow for clinicians to get comfortable with the monologue, movements, and reasoning behind implementing a new exam and survey. Jeffries et al. (2015) describe the importance of providing the best simulation environment and scenario in order to create a positive learning experience. The simulation design would involve a suitable space that would be appropriate in size and setting for learning new skills, correct equipment and placement to allow clinicians to view and demonstrate skills easily, and accessible facilitators who were prepared to answer questions and engage the learners in describing the rationale for the skills. The project director and project champion would facilitate the simulation setting and scenario. They would discuss and set-up the simulation scenarios prior to having clinicians attend. Coordination of the simulation equipment would fall to the project director, as they would have the best idea of what equipment could realistically provide the best simulation based on their knowledge of the proposed outcomes and goals.

### **Application to Practice Change**

The first step for implementation design was coordination by the project director and project champion with the clinic manager for time allotment, such as 3-5 days, for provider

practice in the main clinic site. Three to five days was preferable as many of the providers work different hours and rotate between the two satellite clinics and the main clinic. Three days was expected to be adequate time for each provider and clinical staff member to stop by and practice before seeing patients, between seeing patients, during lunch, or after patients had been seen. The location of the main clinic was central to the providers and was the most accessible site to provide a simulation scenario. Also, it was a building with several conference rooms and extra space for spreading out equipment and practice materials. The equipment needed for an effective simulation scenario was: A single infant dummy with oral assessment access, chairs for practicing the knee-to-knee body/head positioning of the infant, copies of the Bristol Breastfeeding Assessment Tool, copies of a description of the Murphy maneuver, non-sterile gloves, and a table with chairs for discussion as needed.

The project director, project champion, lactation consultant, and ENT surgeon being present to assist with demonstration, answering questions, and explaining the rationale would be most effective. Also, practice of dialogue related to the explanation of the BTAT results and meaning would need to be encouraged after providing a written description of the BTAT and how to interpret it. During those few days, it was planned for the two coordinators, lactation consultant, and ENT physician to be prepared to adjust allotted time, cues during presentations, and debriefing strategies based on responses from various providers and clinical staff (Jeffries, et al., 2015). Another portion of the simulation and demonstration could involve all of the pediatric providers rotating through the ENT surgeon's office on the days he had scheduled frenotomies to assess significant frenulum ties with him, practicing the Murphy maneuver, and then watching him perform the frenotomy in-office. The actual examination of patients with varying frenulum tethers would give providers a more realistic understanding and enhance their self confidence in accurately assessing frenulum tethers in their practice.

### **Evidence-based Practice Change Theory**

Clinical practitioners are often interested primarily in patient care and clinical skills; however, it is pertinent to their success that they are also change agents, educators, and entrepreneurs (Batras, Duff, & Smith, 2016). In order to continue to grow clinicians have to continue to learn the most up-to-date information to keep their skills and knowledge current. Patients rely on dissemination of information by their providers, and even more so now with the wealth of misinformation available online. Also, more now than ever there is a push for interdisciplinary engagement with the hope that each area of expertise can add concepts and theories to practice that the other has not considered, making each better and more comprehensive (Batras, et al., 2016).

Edgar Schein's Theories of Organizational culture is a change theory that involves changing the culture of a group after observing their group dynamics, strategies, goals, assumed roles, and strengths (Batras, et al., 2016). Schein describes the importance of observing the assumed roles and "underlying assumptions" (2016) of employees in a group prior to initiating change. The dynamics by which each group operates are multi-factorial and are delicate, therefore the change agent that was likely to be the most successful was someone within the group who others saw as invested and established. Schein believes if the group appears to be strong and cohesive, their organization leadership is likely responsible, and their values are likely to have created the organization's culture.

It was prudent to reach out to the leaders and develop an effective plan with them that was then introduced to the group after some discussion and development to initiate a successful culture change. This theory suggested that the most effective change would occur if the change agents determined which setting would be the most conducive, i.e. the satellite office or the main

office, and which subgroup would be most likely to find the change beneficial, i.e. the medical assistants and lab staff or the clinicians (Batras, et al., 2016).

### **Application to Practice**

After observing this clinic for several months, it was clear who the major change agents tended to be, and who set the tone for culture modification. There were several clinical providers at several different stages of their career, some of who were planning to retire in the next few years and were less likely to be interested in learning a new practice. However, there was one provider who had been with this practice for several years and had a strong presence in the office who was particularly interested in expanding his skill-set and education on current literature. This provider was the strongest change agent. The proposal of project purpose and strategy were made to him. Current literature and rationales for how assessment, diagnosis, and treatment of lip-tie and tongue-tie affect the practice's patients were provided and explained. After the information was discussed, conversations followed about the most positive, thorough, and effective way to present this change in practice to the group incorporating NLN Jeffries Simulation Theories. The plan involved the local ENT surgeon who performed the majority of frenotomies on infants coming in and demonstrating the Murphy maneuver oral exam with the pediatric providers, as well as the providers practicing monologues with hardcopies of the BTAT over the course of a few days. This simulation and practice would be meant to adequately prepare the providers to perform the new exams with confidence on their patients after the presentations.

Before implementing this change, though, measuring incidence of patients in need and potential outcomes of the implementation were to be achieved by reviewing patient encounters with the change agent to help display the lack of intervention currently in place, and the need for change. According to Schein, this organizational leader's interest and encouraging behaviors

towards the implementation of breastfeeding success measurements and oral assessments for symptomatic infants were positive predictors for achievement (Batra, et al., 2016).

### **Summary**

Enacting change in a practice that was well established and had an embedded culture was a challenge that demanded sufficient preparation and strategy. The Edgar Schein theories of organizational culture provided insight into the cultural design and processes of successful organization. By observing the organization in need of change, being familiar with their systems, goals, and roles, and engaging an influential leader in the organization to act as change agent and take part in the development of a strategy for implementation the beginning steps of culture modification were put into action.

Once a strategy and plan were developed, the NLN Jeffries Simulation Theory would be incorporated into the teaching and development portion by designing a scenario in which providers were to simulate the Murphy maneuver oral examination with a proficient practitioner and review/practice reviewing the BTAT prior to discussing with patients. The process of developing and training the clinical practitioners and staff to use these tools to benefit their patients and patient parents was expected to be a delicate process that took time, attention, and engaged leaders to promote best and current practice.

### **Chapter Four: Pre-Implementation Planning**

In response to current literature stressing breastfeeding importance and the benefits of recognizing ankyloglossia and/or frenulum ties of the maxilla, it was imperative that pediatric clinicians and staff were prepared to assess and respond to these needs. Successful implementation of a project that increased clinician understanding of breastfeeding support skills required pre-implementation planning. This planning included gauging patient and parent needs,

staff/provider needs, and determining the stage of readiness for change that these groups displayed (AHRQ, 2018).

### **Project Purpose**

The purpose of this project was to implement a standard of care for the staff and providers in order to increase breastfeeding support and assessment for tongue and lip-tie in infants who were experiencing breastfeeding difficulties, unresolved symptomatic reflux, and/or failure to thrive.

### **Project Management**

The clinic staff and providers were not entirely in a state of readiness to change. There were specific providers in the practice that voiced a desire for the organization to integrate more breastfeeding support, tongue and lip-tie assessment, diagnosis, and potentially in-office repair. In general, though, when asked about the need for further inquiry when breastfeeding difficulty was a complaint approximately half of the providers voiced an inclination toward learning more about breastfeeding and ankyloglossia/lip-tie, and the other half felt a consultation with lactation support at the nearby hospital was sufficient. In an effort to increase the entire office's readiness to change, the project lead spoke to all providers and most support staff at informational sessions explaining the benefits for their patient population with implementation of increased breastfeeding support and tongue/lip-tie assessment. Explaining in detail the enhanced service that could be provided by expanding lactation support skills, tongue/lip-tie assessment skills, and frenulum-tie repair skills in the office was planned to reduce the resistance to change for providers and staff (AHRQ, 2018).

### **Inter-professional Collaboration**

The project team members including lactation consultants and a local ENT surgeon were the defined interdisciplinary change agents for the organization during the implementation



process and beyond. They would be educating their peers and encouraging the growth of the practice through enhancing skills and idea. The project lead was the Family Nurse Practitioner student who identified a lack of assessment and inquiry by staff and providers about breastfeeding difficulty, unresolved reflux, and failure to thrive in regard to tongue and lip-tie. As a student and non-employee in the organization, this role was unique in that there was no bias nor financial gain. The project director planned to gain support by tailoring the project to fit the organizational routine and needs (AHRQ, 2018). The organization project champion was the pediatrician invested in the organization who saw a need for enhanced practice and services. This team member's role was vital in the education and encouragement of fellow providers and staff, helping to guide the implementation process by recommending practice change. A second organization team leader, who previously worked for a separate clinic where she practiced more breastfeeding support and tongue/lip-tie assessment, was also assisting with education and encouragement of fellow providers and staff in order to enhance the practice ability and services.

Support from another set of nursing specialists was sought after because of their area of specialty. The collaboration with lactation consultants, who perform the majority of breastfeeding education and assessment locally, was to provide a respectable degree of skill and trust needed for successful implementation. Another outside resource and supporting partner, a fellow physician in town trained in otolaryngology and providing the majority of the tongue/lip-tie frenotomies locally, was willing to train the pediatric providers at the clinic to perform frenectomies in-office. This provider's support and buy-in for increasing services at the clinic was especially notable because he had little bias and no financial gain. As an inter-disciplinary resource and change agent, his support portrayed project relevance and importance of dissemination of skills across disciplines.

**Risk Management Assessment**

Similar to a study by Ryke, van Eoden, Koen, and Bain (2015) that utilized SWOT analysis for risk assessment of a multidisciplinary team, the use of the Strengths, Weaknesses, Opportunities, and Threats system allowed the project lead to assess the benefit-risk ratio of implementation at the site during that time. The strengths of the project implementation included having a major partner of the practice interested and involved in the development as well as having had the project lead work closely as a preceptee with the practitioners and staff who were to engage in the practice change. There was substantial trust established from a previous positive interactive experience. The major weakness anticipated by the project lead was the time constraint and varying shifts/locations within which the providers and staff work. The clinic providers and staff worked between three various offices each week, had varying schedules, and were busy seeing patients each day they were scheduled. Finding time to meet with the staff and providers in order to outline, discuss, and refine the implementation process was a challenge.

The opportunities that this project created for organizational growth came from the enhanced skills, support, and services related to breastfeeding and frenulum assessment in the pediatric community. The organization already had a strong patient base and reputation in the community and was likely to strengthen their reputation and increase their patient load with provisions of increased support. The ease and continuity of care provided by pediatric practitioners more educated and skilled in infant needs would produce healthier patients and more satisfied families. Similarly, to Ryke et al.'s (2015) study in which they implemented a project locally within the routines of the study participants, the threat to their success was the belief by participants that integration of new skills and knowledge were not necessary (Ryke et al., 2015). Clinic providers were likely to be hesitant to practice changes due to the longevity of

similar practice styles between them, however, the integration of new skills would ostensibly create measurable outcomes showing whether improvement of patient care was achieved.

### **Organization Approval Process**

Discussions were conducted with the practice champions and office manager to assess producibility and interest. After the written proposal was approved by faculty, hardcopies were given to project team members at the clinic. The office manager and office champions gave their verbal approval as well as written approval through providing a typed official letter of support. The letter of support was reviewed by project faculty and sent on to the program Institutional Review Board committee for further review. The letter of support was specifically for a quality improvement project at the organization.

### **Information Technology**

The Electronic Healthcare Record used by the pediatric clinic would be used for chart audits during the implementation phase. Interdisciplinary collaborative emailing and telecommunication between project lead, ENT surgery, lactation consultation, and the pediatric office staff and providers will also take place in order to coordinate project progress and needs.

### **Cost Analysis of Materials Needed for Project**

The cost analysis for materials determined the cost would be minimal considering most of the tools being used were already in place in the office, including EHR, staff needed, and patient demographics. The necessary expenses would include paper and toner for printing out the Bristol Tongue Assessment Tool (BTAT) hard copy, Murphy maneuver description, and Breastfeeding/Frenulum Assessment Guidelines for each provider. Lastly, there would be the cost of providing lunch for the staff/providers for the educational luncheon. This cost was to be approximately \$100 to provide lunch for the staff and providers on at least two different days during the presentation. The ENT and lactation consultant lecturers would be volunteering their

time for interdisciplinary development. The time providers and staff would need to take away from performing their primary tasks should be minimal as the education and demonstrations for provider/staff education were planned during the lunch hour.

### **Plans for Institutional Review Board Approval**

This quality improvement project was reviewed by East Carolina University's Institutional Review Board and was waived from review. The Letter of Support from the pediatric clinic indicated that an agency Institutional Review Board review was not required.

### **Plan for Project Evaluation**

#### **Demographics**

The demographic information collected were birthday and breastfeeding status of the infants involved in the project via medical records. Only infants 1 day to 6 months-old would be included. Infant ages were reported as the number of breastfeeding infants in age groups ranging from 1 day-1 month and 1 month– 6 month. This table is located in Appendix A.

#### **Outcome Measurement**

The initial outcome was to update the pediatric clinic breastfeeding assessment protocol to incorporate the use of the BTAT for infants up to 6 months of age. This outcome also included the providers ask three questions of breastfeeding mothers to elicit information about latch and nipple health. These questions were: Do you feel baby is able to latch to your nipple? Do you hear suckling when latched? Are you experiencing nipple bruising or bleeding? If any of these three questions elicited answers indicating breastfeeding difficulty for the baby, the BTAT tool was to be used next for lingual assessment.

The second outcome expected was that pediatric clinic practitioners would use the Murphy maneuver oral examination 90% of the time to assess symptomatic infants up to 6 months of age. The Murphy maneuver would be used to assess for posterior tongue tie if no

obvious anterior tongue tie was observed with the BTAT. If a provider using the BTAT and/or Murphy maneuver identified a tongue or lip-tie on a symptomatic infant, the infant would be referred to ENT for frenotomy or have a frenotomy performed in-office. If there were no tongue or lip-tie upon assessment the infant would be referred to lactation consultation at the local hospital for assistance with latch. However, in the amount of time for implementation, numbers measured would be limited due to minimal visits over the slated 3-month implementation timeline.

### **Evaluation Tool**

A chart audit would be conducted to review the use of implemented tools and number of referrals, i.e. three questions, BTAT, Murphy maneuver, lactation, and ENT referrals. The pre-rate was zero due to lack of consistent questioning prior to education, meaning there was no pre-implementation measurement for comparison.

### **Data Analysis**

To measure outcomes, medical records would be reviewed and audited once weekly. The chart audit would include infants 1 day-6 months old who were breastfed. The charts were to be reviewed for any or all of the following diagnoses: Breastfeeding Difficulty, Unresolved Reflux, Failure to Thrive, Short Frenulum, and Ankyloglossia. The Physical Exam and notes portions of eligible infant charts were to be reviewed for provider use of the three questions, BTAT questionnaire assessment, and/or the Murphy maneuver examination. Medical records would also be reviewed for a lactation consultation referral or a referral to ENT after performing the BTAT and Murphy maneuver. These notes were to have been charted by the clinic medical assistants and providers within the Assessment and Physical portion of the patient medical records. The project team leader would organize reports of charts to audit by utilizing the inclusion criteria age ranges, date of service (weekly due to weekly medical record reviews), and

breastfeeding difficulty diagnoses in the Electronic Health Record (EHR) system. The project leader would communicate with providers through the EHR system with secure messages about patients and provider notes. The provider could then respond back with reasoning and rationale for Assessment and Plan in this secure, private setting. This method would assist with productive dialogue between the project lead and the providers in the practice throughout the implementation phase. The medical record review table, seen in Appendix A, would guide the data collection during chart audits. Hard copies of the chart audit tool without patient identifiers would be kept by the project lead to assess and use for measuring outcomes. All other information would be stored on the EHR system at the pediatric office as the primary patient information storage site. A backup storage site would be the project lead's secure university Onedrive. Hard copies of medical record review report data would be kept at the project lead in their project folder through their proposed graduation date of May 2019. After that time, the student's records at the project site, in the project folder would be cleared and any records on Onedrive would be altogether deleted from the University system.

### **Summary**

The pre-implementation process involved preparation for the cohort to be involved and the coordinator who was to plan, do, check, and act prior to implementation. The organization had to be ready for change, the coordinator had to understand the process of implementation and outcomes and be able to relay that information concisely to the organization. The coordinator also planned to have processes in place to measure outcomes and analyze those measurements and outcomes. The breastfeeding difficulty and tongue-tie assessment implementation project would involve a number of leaders and change agents, low risk, a short duration in which to measure the implementation, and a relatively simple process of evaluation. Each stage would involve tools that were to be implemented or were already in place at the pediatric clinic.

## **Chapter Five: Implementation**

The implementation of a more thorough and standardized history and physical exam assessing breastfeeding success, tongue, and lip function was a prudent addition to breastfeeding support and frenulum-tie assessment for this pediatric clinic. The American Academy of Pediatrics (2015) recommends that the initial pediatric visit utilize a standardized assessment of feeding, maternal comfort feeding, and neonatal intake. The pediatric clinicians at this local clinic assess growth, urination patterns, stooling, and ask parents about difficulties, however breastfeeding mothers needed to be asked specific questions about latch, suckle, and comfort to elicit concerns about comfort and success. The mother's comfort and assessment of breastfeeding capabilities is sometimes left to obstetrics clinicians; however, their expertise lies predominantly with treating the mother, not the infant. Pediatric providers need to be assessing mother and neonate breastfeeding experience early with the Bristol Tongue Assessment Tool (BTAT) so interventions, such as lactation consultation and/or further oral examination/intervention can improve the breastfeeding experience. This chapter will provide insight into where the implementation process took place as well as the details involved in the implementation process for the pediatric practice staff, project director, and patient participants.

### **Setting**

Pediatric offices are the first-line of assessment when mother and child leave the hospital. A goal for pediatric practices is to encourage and assist with successful breastfeeding up to at least 6 months, preferably 12 months, and ideally exclusively through 3-6 months as American Academy of Pediatrics recommends, and Healthy People 2020 has made a global goal (AAP, 2015; ODPHP, 2018).

The project site was a private pediatric practice with the main clinic site in a small city in eastern North Carolina (NC) with two satellite clinics in neighboring towns that providers and

employees rotated through regularly. The city in rural NC was home to less than 100,000 people with the proximal towns adding populations of 10,000 and 5,000 respectively. Each provider saw approximately 15-30 patients a day 4-5 days a week with 2-3 weeks off each year. The rough estimate of patients seen annually between the 8 providers was 45,000. The ages of patients seen were neonate, 1-30 days old, through 18 years of age.

This practice employed approximately 8 ancillary staff, 14 support clinical staff, and 4 management providers in order to best serve the pediatric population of eastern NC. The process of training individuals to the extent of becoming a certified breastfeeding center was deemed expensive, time-consuming, and was not a high priority at the time. A simpler solution was to implement provider tools in order to better assess patient experiences and provide interventions in the form of in-office examinations or procedures, referrals to lactation consultants for further guidance, or referral to ENT for frenotomy repair.

### **Participants**

Provider participants were all pediatric-trained clinicians in the practice as well as some medical assistants and lab staff. Provider training participants included one family nurse practitioner student, one ENT surgeon, and one lactation consultant. Patient participants included current or new patients being seen for initial visits post-delivery, well-child or episodic visits at the clinic. The BTAT and Murphy maneuvers were to be a portion of the examination the infants would receive during their visit if they met the inclusion criteria. Patient participants needed to meet inclusion criteria of 1 day to 6 months of age and breastfeeding or experiencing failure to thrive or intractable reflux. Exclusion criteria included the presence of a known cleft palate and/or cleft lip as those anomalies also are associated with breastfeeding difficulty.



## **Recruitment**

Patients were not recruited for this project. Rather, patient charts were retrospectively reviewed for data collection post-implementation. Clinical assistants or providers identified patients ages 1 day-6 months of age who were experiencing breastfeeding difficulty and/or experiencing failure to thrive, or intractable reflux for 12 weeks between September 2018 and November 2018 for implementation of project tools and post-implementation chart audits. Upon identification of any of the aforementioned inclusion criteria, the provider was to ask three questions of the parent/guardian about latch, proceed with visualizing the tongue using the BTAT to guide the assessment of shape and extent of tethering, and perform the Murphy maneuver if there was a low score on the BTAT or no obvious anterior tongue frenulum tethering prior to referring to lactation consultation or ENT for a frenotomy.

## **Implementation Process**

### **Phase I: Staff Education**

During phase I, the staff at the pediatric clinic were given a presentation in conjunction with hard copies of the assessment guideline with a BTAT measuring tool including severity measure key, and the description of how to perform the Murphy maneuver. There were 4 one-two hour-long presentations given by the student project lead in order to make sure all of the staff were able to attend. Two presentations were held at the main office on different days during lunch in the conference room for 2-4 providers and 3-4 staff members at a time. Two presentations were held in one of the satellite offices during lunch in the conference room for one provider and 3 staff each presentation.

During each presentation the providers were each given hard copies of the tools to be utilized, as well as descriptions of the tools and studies they had been tested in. The presentations also involved discussion of goals of the implementation, the prospective patient outcomes, the chart auditing process, along with the methods for review and discussion over the following months. There was time for detailed explanation of each tool/procedure, as well as questions by providers and staff during each presentation. The only presentation the lactation consultant was able to attend and assist with was the initial presentation at the main clinic with 4 providers present.

The Murphy maneuver, which involves further oral assessment for tongue-tie, was intended to be practiced by clinicians during the presentation. However, due to lack of existing oral examination simulation equipment, time constraints, and qualified practitioners to demonstrate, it was discussed and described instead.

### Phase II: Procedure

During phase II, over a –week timeframe, the staff began to identify patients 1 day to 6 months of age with breastfeeding difficulties and/or intractable reflux or failure to thrive for further assessment. The providers were instructed to first ask three questions if the infant was of the right age and breastfeeding, or of the right age and symptomatic for the aforementioned. These questions were: 1. Do you feel baby is latching well to both nipples? 2. Do you hear suckling when baby is latched? 3. Are you having nipple bruising or bleeding? If the first two of these questions were answered “No” or the third answered “Yes”, the provider was instructed to use the BTAT to guide their visual assessment of the tongue looking for shape, point of frenulum attachment, tongue mobility, and ability to protrude.

Depending on the results of the BTAT, 0-4 being most severe and suggesting a need for frenotomy, and 4-8 being less severe and requiring more assessment with the Murphy maneuver. The provider was then to perform the under-the-tongue sweep with the index finger to feel for tethering of the frenulum that may have been less visually obvious. If the provider gauged the tongue to measure 4-8 with the BTAT and did not feel any tethering with the Murphy maneuver, it was recommended they refer mother and baby to a lactation consultant for free at the local hospital. The lactation consultant informed the providers during the initial presentation that she and her colleagues were there to instruct the mother in areas that would improve breastfeeding. If the infant was sent to lactation consulting he/she was then scheduled to return to the pediatric office within 12-24 hours of the consultation for weight and reassessment. If at that time the mother was not satisfied, or the infant had not achieved adequate intake measured by no weight gain, weight loss, or  $< 1$  oz. weight gain/24 hrs, the treating pediatric clinician was encouraged to refer to ENT for frenotomy repair or schedule a frenotomy with the trained in-office pediatric provider.

### Phase III: Retrospective Review of Medical Records

The analysis of the implementation in Phase II commenced after the 6-week implementation process. The project lead began reviewing charts identifying infants younger than 6 months of age between September and November 2018 who met the criteria for lip/tongue tie assessment and breastfeeding support. The charts were analyzed for documentation of ICD 10 codes for Breastfeeding Difficulty, Failure to Thrive, and/or Intractable Reflux. Those charts were reviewed for notes stating the three questions were asked, BTAT tool was used, and/or the Murphy maneuver examination was utilized. The records were also reviewed for referrals to lactation consulting or ENT.

### **Plan Variation**

Plan variation occurred during the implementation process as obstacles and hindrances were discovered. The initial variation came during the first presentation when one of the providers inquired about the validity of the BTAT for use in their office. This concern was due to the fact that it had not been used in countries other than the UK and New Zealand at the time of the presentation. This created some wariness around the use of the BTAT as a valid tool, though its validity was confirmed by studies in the UK in 2015 and 2017. Also, 3 providers voiced their apprehension to use the BTAT due to trusting their experience with visualizing frenulum tethers. The providers' concern over the validity of the BTAT compared to their own assessment experience hindered their initial enthusiasm and belief that this tool could help guide their examinations. The providers who were skeptical of the BTAT were encouraged to use the older and commonly circulating Hazelbaker Assessment Tool for Lingual Frenulum Function (HATLFF) as a tool if they had any insecurities with their examination. Despite the reported concerns, however, when surveyed, the providers that responded answered they were more confident with lingual frenulum assessments knowing they could utilize the BTAT.

Another obstacle was encountered when none of the breastfeeding or oral specialists were consistent in their oral examinations, especially with the use of the Murphy maneuver. This created a situation where the demonstration of the maneuver was not possible with the exception of watching video recording of the maneuver being performed. The providers voiced their concern about performing the maneuver without having had experience feeling a normal frenulum versus a tethered frenulum or knowing exactly what to feel for due to lack of palpation in this area. The ENT surgeon stated he assessed for "deeper" lingual tethers by pressing on either side of the base of the tongue at the same time with both index fingers to assess the

frenulum, however, did not perform this routinely and was unable to come demonstrate at the pediatric office due to schedule constraints. The lack of a reliable demonstration of the murphy maneuver decreased provider trust in the performing the procedure correctly. This lack of certainty decreased the likelihood of their utilization of the maneuver. The response to this challenge was to share written, hard-copy descriptions of the Murphy maneuver to each provider so they could practice during exams based on a step-by-step description.

A third variation in the plan involved the underlying frustration by the pediatric clinicians with the lactation consultants. The pediatricians felt the lactation consultants prematurely diagnosed tongue or lip tie for new mothers post-delivery before the pediatrician was able to properly assess, setting the tone for a plan without their involvement. The animosity between the two disciplines created by this factor was not anticipated and made for some challenges in forming trust and rapport between the two. The pediatric clinicians were less inclined to appreciate or use the lactation consultants even though they were presented as an interdisciplinary ally for enhancing breastfeeding success. In response, the plan was adapted so the lactation consultants were given feedback about making a premature tongue/lip-tie diagnosis prior to the provider also examining and developing a plan.

At the midway point of the implementation phase there was concern that providers were not as engaged or active in the change process as the project lead had anticipated. Faculty and project lead determined it would be helpful to measure provider understanding of the project and plan. Anonymous surveys were created and sent through work emails to providers. The surveys asked four main questions and four sub-questions of the providers. The anonymous answers to these questions were helpful in gauging their comfort, understanding, and interest in the project. The questions asked were as follows: 1a. Do you feel like the Breastfeeding and Tongue Tie

Assessment Project information presented to you has been useful to you in your practice? 1b. Would you explain how it has been useful? 2a. Do you think you will use the Bristol Tongue Assessment Tool (BTAT) to help measure tongue-tie severity? 2b. Would you explain your answer? 3a. Do you think you will use the Murphy maneuver finger examination in your assessment for tongue-tie? 3b. Would you explain your answer? 4a. Do you think you will refer more infants to lactation consulting or ENT in response to the project presentation? 4b. Would you explain why or why not?

After the surveys were distributed the project lead waited 1.5 weeks before sending out reminder emails to each provider about the survey. After three weeks a total of four providers had completed the survey out of eight. The clinic technological manager stated she believed the four providers who had not completed the survey were unlikely to due to their infrequent checking/completion of emails. The four survey responses were unanimously positive in their feedback. The responses conveyed appreciation for the enhanced knowledge provided in the presentations, a confidence with the use of the tools and information to more thoroughly assess infants, and an intent to use the tools and assessment techniques to better care for their patients. Due to the results of the survey, further plan adaptation was aborted.

### **Summary**

The implementation of the project involved detailed education, guidance, practicing of new skills, and a change in thought process for the staff and providers involved. The process took 14 weeks, 12 of which involved medical record reviews and a Qualtrics survey of providers for information they felt they were lacking after the implementation. The audits, EHR messaging between providers and project lead allowed for ample opportunities for providers to

introduce the tools they learned into practice, ask questions about the process and tools, and allowed for time to review and analyze the implementation success.

## **Chapter Six: Evaluation of the Practice Change Initiative**

This chapter discusses the progression of data evaluation and results. Patient demographics and results are explained and portrayed through figures indicating the increase in screening and the need for increased utilization of assessment tools and referrals for intervention. The implementation of a standard of care in screening for breastfeeding difficulty was accomplished. During the review of medical records and discussion with providers about the education it was apparent that the dissemination of evidence-based information and guidelines to assist with increased screening for tongue/lip-tie was successful. However, the knowledge, skills, and motivation to use assessment tools successively are areas that will need more development. These details are depicted below as the discussion of the evaluation process proceeds.

### **Patient Demographics**

During weekly review of medical records of infants 6 months old or less, 109 records were reviewed. The inclusion criteria were age, diagnosis of breastfeeding, intractable reflux, or failure to thrive. Also, only infants seen between time of project implementation and project end were included. Patient records were assessed for breastfeeding difficulty screening usage, using the Bristol Tongue Assessment Tool (BTAT) and/or Murphy Maneuver tool, and referral to Lactation Consulting or ENT.

### **Intended Outcomes**

The project design and implementation were executed with the intent of establishing a standardized screening, assessment, and treatment process for infants with breastfeeding

difficulty related to tongue and/or lip-tie. The initial outcome was to implement a breastfeeding success protocol at the pediatric clinic within which the BTAT would be used by providers to assess for tongue-tie. Patient records were to be reviewed to measure whether BTAT was being used or not. The second outcome was that providers would utilize the Murphy maneuver oral exam to assess for posterior tongue-tie in relation to reports of difficulty breastfeeding. Patient records were also to be reviewed for use of the Murphy maneuver exam, and usage tallied. The outcomes evolved as the project design got closer to implementation based on the organizational needs, culture, and lack of consistent screening process to discern if difficulty breastfeeding was present. With the implementation of the screening questions prior to assessment tools the original outcomes were still intended but were secondary to a new outcome of prioritizing screening for all breastfeeding infants at each visit up to 6 months of age. The importance of screening as an outcome was significant because it was a stepping off point for providers toward a change in practice that could be easily implemented.

## **Findings**

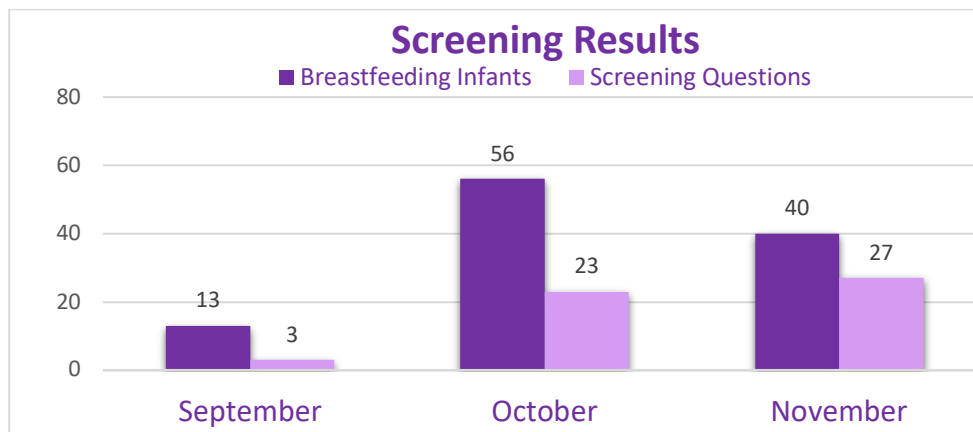
### **Breastfeeding Difficulty Screening**

During the project implementation timeline there were three weeks in September, 4 weeks in October, and 4 weeks in November for generating data and collection of data. In the three weeks of September 2018, after literature and guideline dissemination, 3 out of 13 breastfeeding infants were asked the screening questions. In the month of October, 2018, the number increased to 23 out of 56 breastfeeding infants having been asked screening questions. In the final month, November, 2018, 27 out of 40 breastfeeding infants were asked screening questions. There were no infants 6 months or younger who were seen for intractable reflux or failure to thrive, so no screening questions were asked for other groups outside of breastfeeding



infants. Figure 1. Screening Results below, shows the increasing number of screening questions used over the implementation phase.

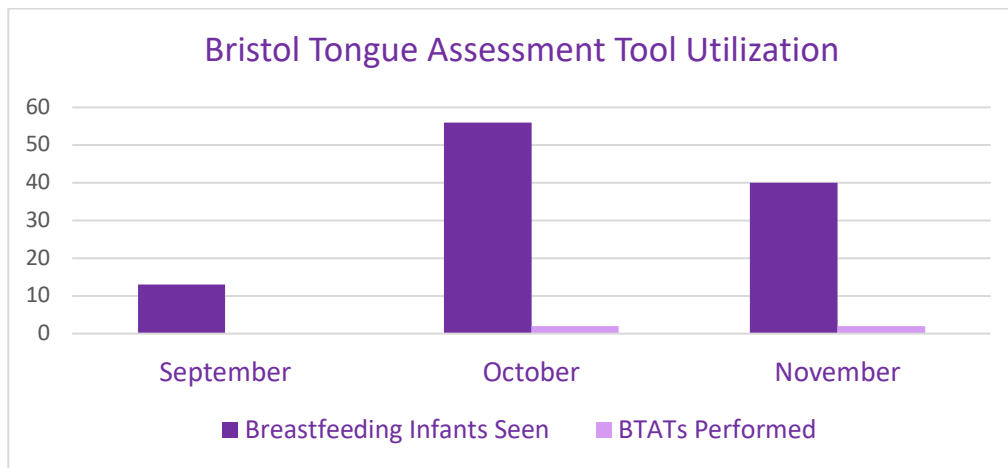
Figure 1. Screening Results



### Utilization of BTAT

The guidelines given to providers recommended using the Bristol Tongue Assessment Tool to assess the tongue of infants who screened positively for breastfeeding difficulty. There was no clear documentation by providers on which screens were positive or negative of the infants screened. The documentation either dictated that there was a visual tongue assessment, BTAT, performed or not. Therefore, data does not clarify whether the BTAT was performed in response to a positive screen or not, but does portray BTATs performed on breastfeeding infants 6 months old or younger because of the inclusion criteria parameters. During the three weeks in September, post-presentation, there were 0 BTATs performed on 13 breastfeeding infants. During the month of October there were 56 breastfeeding infants seen and 2 BTATs performed. During the month of November there were 40 breastfeeding infants seen and 2 BTATs performed. Figure 2., Bristol Tongue Assessment Tool Utilization, portrays the number of visual assessments completed during the project implementation phase.

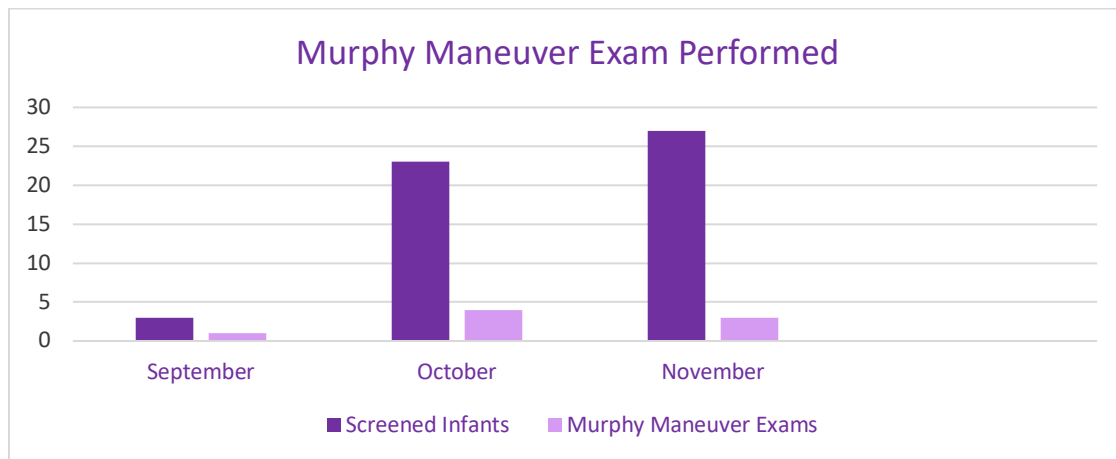
Figure 2. Bristol Tongue Assessment Tool Utilization



### Utilization of Murphy Maneuver

The guidelines given to providers recommended using the Murphy maneuver lingual frenulum exam in response to positive screening questions for breastfeeding difficulty and if the BTAT assessment was negative for frenulum a tether. Charts were reviewed for provider notes discussing Murphy maneuver utilization, frenulum-grading, and/or frenulum descriptions. While there was no clear documentation about whether the infants screened were positive for breastfeeding difficulty or not, the number of Murphy maneuvers performed was tallied during the review of medical records. During the post-presentation three weeks of September there was 1 Murphy maneuver completed for the 3 screened infants reviewed. During the month of October there were 4 Murphy maneuvers performed on 23 screened infants. During the month of November there were 3 Murphy maneuvers performed on 27 positively screened infants. The use of this examination tool increased during the 4 weeks of October with slight decline during November, as seen in Figure 3., Murphy Maneuver Exam Performed.

Figure 3. Murphy Maneuver Exam Performed

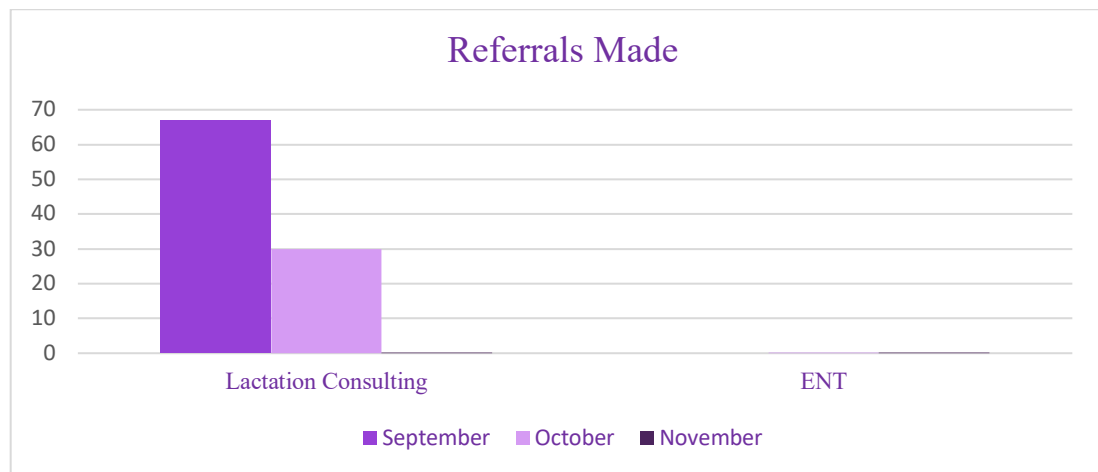


### Referrals Made

Established providers in the pediatric office were already referring infants with suspected tongue/lip-tie to ENT or lactation consulting with some regularity prior to project implementation. However, some of the newer providers were unsure of the proper channels to utilize for these referrals and how to decide between which referral to make. The guidelines presented to providers during project education gave instruction on which specialty provider to send to based on assessment tool scoring. Though, there was no documentation of scoring tongue/lip-tie severity in any charts reviewed, referrals to lactation consulting and ENT were both observed from September through November. See Appendix A for the scoring and referral recommendations table. Results for referrals made by providers post-presentation also increased during the month of October, midway through the implementation process, while they decreased slightly during November. There were 2 referrals made to Lactation Consulting out of 3 screened infants in September. There were 9 referrals out of 23 screens in October, 2 to ENT and 7 referred to Lactation Consulting. There were 6 total referrals in November out of 27

screenings, 2 of which were to ENT and 4 to Lactation Consulting. Figure 4., Referrals Made below, depicts the referral trends during implementation.

Figure 4. Referrals Made



The medical records, messaging with providers, and surveys mostly followed a positive trend indicative of a shift in attitude and skills toward a growing inclination toward enhanced breastfeeding assessment, support, and tongue/lip-tie evaluation. The growing trend in the providers asking screening questions during the implementation process correlates to the intended outcome of establishing more of an awareness of tongue/lip-tie as a potential cause for breastfeeding difficulty.

### Qualtrics Survey of Providers

To measure the understanding and engagement with the education, guidelines, and tools provided a Qualtrics survey was designed and emailed to each provider. This survey asked 8 questions about the understanding and likelihood of usage of the screen, BTAT, and Murphy maneuver. Out of 8 surveys sent, 4 responded, and all 4 with positive feedback that the screen and tools were useful and they had learned a lot about a topic they knew little about previously. These 4 providers intended to use the screen and tools in their practice.

### **Summary**

The practice change initiative was successful in altering the awareness of providers in this practice, providing reproducible guidelines to follow, and promoting community health through pediatric breastfeeding support. The greatest outcome was the increase in screening questions asked throughout implementation. Another gain for providers and patients was the survey response that at least half of the providers were pleased with their enhanced knowledge of this topic and intended to use the assessment and evaluation tools in practice. Implications for practice, however, are that the providers continue to increase their screening until every breastfeeding infant to 6 months is screened, the assessment tools are used to assess each positively screened infant, and timely referrals are made for intervention preventing early cessation of breastfeeding.

### **Chapter Seven: Implications for Practice**

After evaluating practice change initiatives, the outcomes perceived, and the outcomes realized, the implications for practice were identified. Two of the initial expected outcomes became implications for practice because more time is needed to change this pediatric practice culture entirely in regard to tongue-tie evaluation and intervention. The expectation after evaluating is that the practice of screening breastfeeding infants for breastfeeding difficulties will continue to rise until it is a standard practice and the actions taken in response to screening will follow the recommendations laid out by the guidelines presented to practitioners.

#### **Practice Implications**

There are still achievable culture and practice changes for this pediatric practice since building momentum with the breastfeeding difficulty screening. This project was formed with the intentions of serving a pediatric population that needed more attention and with the intentions of meeting eight AACN DNP essentials meant to guide the actions and decisions of advanced

nursing practice. Each implication for practice identified relates to what the DNP essentials intended for growth and advancement of practice of nurses and clinical specialists. The project lead and pediatric practice will continue to be influenced by each implication.

### **Essential I: Scientific underpinnings for practice**

According to the American Association of Colleges of Nursing (2006), the first essential acknowledges the growth of practice competency through utilization and implementation of research and evidence-based practice. After observing a gap in care at a community pediatric clinic a review of literature revealed that tongue and lip frenulum ties found in infancy were potentially negatively effecting breastfeeding. Information on tongue and lip-tie, according to Power and Murphy (2015) was not extensive at the time but showed a small, but significant prevalence for frenulum ties in infants and a significant correlation to difficulty breastfeeding. The area of debate was how to intervene or whether to intervene at all. The majority of the literature showed positive outcomes for breastfeeding success with identification and intervention of tongue/lip-ties but there were few recommended standards of care (Pransky, Lago, and Hong, 2015; Sharma and Jayarai, 2015).

The NLN Jeffries Simulation Theory and Edgar Schein Organizational Culture Theories were models used to design practice and culture change for the pediatric office providers and staff (Jeffries, Rodgers, & Adamson, 2015). The development and implementation of the educational in-service for staff was based on the simulation theory's proposed lecture and simulation approach, observed to increase confidence in new skills and knowledge through tactile practice with peers. The development and evaluation of the project was also influenced by Edgar Schein's theory that assumptions lead to values that then shape practice (Batra, Duff, & Smith, 2016). The observation of the providers and staff in this group prior to project development and implementation allowed for an understanding of what assumptions were

present and how they could be changed with evidence-based practice. A related implication is that pediatric providers utilize their guidelines and training to enable themselves to execute prompt surgical or referral interventions to remedy tongue and/or lip-ties hindering effective breastfeeding or effective digestive processes.

Current literature is recommending the use of a standardized subjective breastfeeding difficulty tool along with frenulum grading tools that can assist practitioners with prompt intervention to prevent early breastfeeding cessation. A suggestion for further research would be for research doctorates to perform a focused study with a large cohort on the rates of breastfeeding success at 6 months of age between infants with tongue and/or lip-tie diagnoses without frenotomies compared to the same demographic who had the surgical intervention. The results would likely yield an accurate picture of the likelihood of early cessation without frenotomy. This data would help guide clinical doctorates with practice change, pivoting more toward early surgical/ manipulative intervention or more of a wait-and-see approach.

## **Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking**

This project addressed organizational methods and assumptions in practice that are not necessarily best practice. The development of a guideline and implementation to practitioners was meant to drive better practice and an increasingly supportive culture of breastfeeding for the community. The economic repercussions are nil if there is no long-term change in practice or newly adopted skills. However, if the providers consistently screen and determine there is a need for intervention the project champion is equipped to treat in-office and train his colleagues to do the same. This skill-set was developed during implementation of the project with the collaboration between pediatric providers and the project champion ENT surgeon. However, with the involvement of other disciplines, some of the pediatric providers were challenged to

question their skill-set and abilities which prompted them to dissociate from the quality improvement effort.

There were notable system gaps in care between the pediatric providers, ENT surgeon, and lactation consultants in relation to how they assessed the oral cavity and how they screened mother and infant for breastfeeding success. There were also gaps just within the pediatric practice in their assessment of the infant oral cavity, breastfeeding status inquiry and intervention time-line. Cohesive systems thinking for pediatric care in this community, including all aforementioned disciplines, would better support breastfeeding continuity instead of individualized practices that often do not reinforce each other. If a clear plan of system thinking was introduced to each disciplines and incorporated at the same time, they would be better equipped to comprehend and act upon the challenges they face, each providing perspective on the gap in care (Wilkinson, J., Goff, M., Rusoja, E. Hansen, C., Swanson, R.C., (2018).

Based on the Plan-Do-Study-Act model, the literature was put into a succinct guideline, edited after gathering perspectives on provider stance on the topic, and disseminated to providers through educational lecture and visual handouts. Reiteration of project information was completed through medical record reviews and individualized feedback in the electronic record. A survey of anonymous providers' view regarding success of the educational sessions and this feedback created a chance for the project director to act appropriately to concerns or needs. The timeline that governs most health care systems creates a barrier for PDSA quality improvement success but is much more attainable for the smaller practices with few practitioners because there is less lag time in discussion due to increased accessibility to providers. In larger practices, in order to sustain this type of project the administrators and key players, such as a site champion, need to be completely onboard and revisiting the topic consistently to discuss concerns, goals, and successes. If this type of project were implemented on a large-scale within a medical center



or other healthcare system, there would need to be many aspects of strategy involved, including: provider reminder systems, fluid transmission of patient health information, mandatory structured provider education session, and patient education with physical printed materials and resource databases.

Untoward observations and reactions are inevitable during quality improvement, due to the nature of calling into question a practice that is outdated or inappropriate. In this particular project and practice the practitioners were not acting inappropriately, however they were conflicted by the concern that their practice was outdated and ethical dilemma that literature on tongue/lip-tie assessment and intervention was gaining momentum in response to dentists increasing unnecessary frenotomy procedures to increase revenue. Though their concerns were not beyond reason, the greater concern remains whether or not they are providing the best care for their patients. Considering the number of infants who were weaned from breastfeeding prior to 6 months of age in their practice and in this community, the implication is that there is still a need for improved breastfeeding support and screening for breastfeeding difficulty can provide insight into the need for intervention and education.

### **Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice**

This project engaged clinical scholarship through sharing literature and insight provided by researchers and clinicians with pediatric providers. The literature about breastfeeding assessment tools and anyloglossia correlation with breastfeeding reviewed during the development of the project was disseminated amongst providers in the form of an abridged outline relaying the most up-to-date recommendations of tools and interventions. The guideline included literature from Hill & Ruggiero's (2017) case study describing the use of the Murphy maneuver exam in finding a tight, tethered posterior lingual frenulum causing dysphagia. The project director engaged in clinical scholarship when compiling the guideline by sharing what

Ingram, Johnson, Copeland, & Churchill (2015) presented in their article comparing two tongue assessment tools. The complex nature of this topic involved specialty provider input from lactation consultants, ENT surgeons, and pediatric providers. The project director discussed the project purpose and literature recommendations with each discipline prior to coordinating their interdisciplinary discussion. The screening questions applied in project clinical guideline were created based on questions asked by lactation consulting when assessing latch.

Use of the guidelines created by the project director was discussed and edited after each discipline contributed their knowledge on the topic. The finished guideline was printed out and shared with each group, increasing accessibility and ease of dissemination. Hardcopies of the designed guideline, literature matrix, Bristol Tongue Assessment Tool (BTAT), and a description of the Murphy maneuver exam were given to each pediatric provider during project presentations. Copies are also available in the pediatric office for reference. These guidelines will also be presented and discussed with scholarly faculty and community leaders, sparking conversation about the importance of compilation and dissemination of literature for practice improvement. Leadership to engage and connect clinicians with current evidence is of great importance in health care and advanced nurse practitioners are becoming proponents of this process. The most vital implication of practice is the importance of further evaluation of each infant with a positive breastfeeding difficulty screen with the reputable BTAT and/or Murphy Maneuver tools to determine severity of tongue/lip-tie.

#### **Essential IV: Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Healthcare**

The use of Electronic Health Records (EHR) made identification of patients with related diagnoses readily available. The ability to create reports of these patients within this system and review their charts weekly allowed for consistent and manageable auditing. The exam and

assessment notes in each patient chart audited showed whether or not screening questions were asked, whether any tools were used in response to a positive screen, and whether a referral to lactation of ENT was made. This information allowed for evaluation of provider understanding and engagement. In response to certain notes or a lack of notes for pertinent patients, individual messages were sent to providers asking for rationale or asking if certain considerations were made. This system was easy to use and effective for evaluating a portion of the implementation. Another helpful system was an anonymous survey of providers that provided them an outlet to give honest feedback about implementation information. Without the EHR and survey technologies data review would be an inefficient process, taking far longer than 2-3 months. These systems allowed the project director to efficiently manage and decipher outcomes and deficiencies in the project. Electronic Health Records and online survey templates/generators are scalable methods for categorizing and identifying the patient cohorts needed for review, making QI projects more achievable (Sholle et al., 2018).

### **Essential V: Health Care Policy for Advocacy in Health Care**

The U.S. Preventative Task Force (2016) called for primary care setting interventions in policy and programs, including staff training, in the effort to improve breastfeeding support on the community and national level. The policies dictating practice in this private pediatric group were mainly created by the providers of the office. The lack of a policy identifying any standardized breastfeeding support created a barrier for consistent and efficient care. Also, the inability to see the same provider for consecutive visits due to rotations and varying schedules prevented patients from obtaining congruent instructions and advice, which is particularly important during time-sensitive health care concerns, like breastfeeding. The implications for practice at this pediatric office are to adopt a written breastfeeding policy, such as that provided by American Breastfeeding Medicine and to designate a provider or specific providers who

advance their skills and knowledge of breastfeeding support in order to affect the most positive experience through consistency (American Academy of Pediatrics, 2015). Implications on the national scale are that the need for access to breastfeeding supportive agencies and resources should be a priority and pediatric practices should be incentivized with reimbursement correlating to their breastfeeding success rates up to at least 6 months.

The patients served in this particular clinic were mostly state-funding insured patients with limited reimbursement, which hindered some incentive for providers to spend increased time with patients, instead placing priority on seeing higher number of patients. There have been many policy implementations by state and federal government to support breastfeeding by covering costs of support and supplies and information is available at sites like The National Women's Law Center's Breastfeeding Toolkit (The American College of Obstetricians and Gynecologists, 2018). However, state-funded insurance programs should prioritize breastfeeding support as a reimbursable service for pediatric providers along with lactation consultants and health departments (Wouk, Chetwynd, Vitaglione, & Sullivan, 2017). Lobbying for changes in insurance coverage and priority, local practice policy changes, and national culture changes toward betterment of health are possible for advanced nurse practitioners and all practitioners through active involvement with boards of nursing, medicine, and other legislative bodies.

## **Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes**

Clinical practitioners working in specialties are often aware of their peers in other general and specialty roles but do not reach out for interprofessional advisement or quality/system improvement discussion because of time constraints related to the business of running a practice. Therefore, more progress is made between inter-professionals when a liaison from each office,

who is familiar with varying services, is able to reach out and coordinate collaboration on their behalf.

The initial presentation to pediatric providers included a round table discussion after the presentation with questions and answers during which a lactation consultant and the project director answered questions. This merging of varying disciplines was developed in response to The American Academy of Pediatrics (2015) endorsing and encouraging collaborative efforts between pediatric providers and lactation consultants in the effort to create standards of breastfeeding support. In a similar vein, after the dissemination of clinical guidelines to the pediatric providers, the project director organized a training session between ENT and the project site champion pediatrician to observe an oral assessment and frenotomy in the ENT office.

Increased communication between pediatrics and a variety of specialties, such as gastrointestinal and/or endocrinology is encouraged in response to an infant suspected of having reflux or failure to thrive (Hill & Ruggiero, 2017). If each clinician assessed the infant with the BTAT or Murphy maneuver for a lingual or labial tie before prescribing medication or using imaging, they may find that a tethered frenulum is causing difficulty with ingestion instead of reflux, intestinal tract anomalies, or endocrine abnormalities (Hill & Ruggiero, 2017). Similarly, as Walsh and Tunkel (2017) suggested, if each specialty used the same techniques and tools for examining, in a standardized fashion, there would be fewer discrepancies in the plan of care and increased efficiency in treatment.

## **Essential VII: Clinical Prevention and Population Health for Improving the Nation's Health.**

This project involved observation of the realities of health promotion in real-time in response to a gap in care for breastfed infants. The lack of pediatric training on breastfeeding has affected the aptitude of providers regarding investigating causes for breastfeeding difficulty.

American Academy of Pediatrics' Clinical Report on The Breastfeeding-Friendly Pediatric Office Practice (2017) states "for the national breastfeeding targets to be met, outpatient support from pediatricians and other pediatric providers is imperative" (p e2). The Healthy People 2020 goal of increasing the number of exclusively breastfed infants at 6 months of age to 81.9% is far from a reality with only 22.3% of US infants breastfeeding exclusively at 6 months of age. Despite vast past and current literature supporting breastfeeding as the most beneficial form of nutrition, bonding, and prophylaxis for chronic disease it was as widely promoted by pediatric providers in the 21<sup>st</sup> century as it had been in previous years (AAP, 2017).

This project addressed this lack of pediatric investigation into breastfeeding difficulties at this particular practice and attempted to remedy the gap by presenting and promoting recommendations for screening and use of tools. This community pediatric practice and the patients seen here would benefit from incentives promoting thorough screening of breastfeeding difficulty and timely intervention. Consistently assessing for breastfeeding difficulties with standardized screening and tools would lead to a greater number of infants exclusively breastfed and ultimately healthier throughout childhood and adulthood (AAP, 2017). A couple of ways practices could incentivize health care promotion that would propel employee development of evidence-based practice are offering monetary incentives for continuing education and quality improvement work.

### **Essential VIII: Advanced Nursing Practice**

This project recognized a need for practitioners to prioritize identification of gaps in care within their practice as well as a need for advanced practitioners who are able to design and implement practice change in response to those gaps. The education and preparation Doctor of Nursing Practice (DNP) practitioners receive prioritizes clinical skills along with an awareness of need to enhance health care and medicine through culture change and implementation of

research-driven practices. For pediatric inpatient and outpatient centers the implications are that breastfeeding should be supported with screenings for difficulties, examinations for oral anomalies, and prompt intervention involving latching techniques, frenulum release, or further education by lactation consulting (AAP, 2017).

On a larger scale, hospital mother-baby units should be consistently screening with the LATCH questionnaire or an abridged version as in this project for breastfeeding difficulties within the first 24 hours. These inpatient settings should also be providing clear instructions on who to contact once discharged, and available resources like lactation consulting, the health department, and the pediatric office. Nurses and providers in-house should also encourage mothers to take swift action with any concerns or difficulties (AAP, 2017). Collaboration between mother-baby units and pediatric offices with policies and practice that align would create a more seamless and efficient process for mothers and infants (AAP, 2017). If mothers and infants came to this pediatric practice from the hospital with clear instructions on what difficulties to be aware of, what resources were available, and what to expect from the pediatric visit there would be more time for the pediatric provider to assess and examine in lieu of explaining basics.

The doctorate-educated nurse practitioner has the ability to navigate quality improvement gaps in care such as the lack of continuity of care, standardized assessment and recommendations, and education/skill-sets pertinent to demographic health promotion. Implications for practices hiring new DNP practitioners are that they should recognize the special skill of quality improvement as a bonus to practice. They should incentivize the utilization of that skill with allotted time for QI work, continuing education hours, and/or monetary means so that practitioners will go into their new role with the intentions and ability to perform this task as well as clinical tasks.

## **Chapter Eight: Final Conclusions**

This project sought to address a gap in care for a fragile population during a time of great advantage or disadvantage dependent upon the education and treatment received. The purpose was to disseminate up-to-date clinical and theoretical information to this practice for implementation of standardized clinical assessment, preventing the gap in care of missed tongue/lip-ties contributing to breastfeeding difficulty. Though pediatric providers are not the only resource for infant care and breastfeeding support, they play a vital role in encouraging successful breastfeeding. There are many obstacles that can create difficulty breastfeeding and the oral anomalies tongue and lip-tie are amongst them. Literature discussing the significance of tongue and lip-tie as factor causing breastfeeding difficulty is not expansive but is consistent in the conclusion that intervention for infants with diagnosed tongue and/or lip tie has a positive correlation with breastfeeding success status-post surgical repair (Power & Murphy, 2015). In order to decide whether tongue/lip-tie is significantly affecting breastfeeding, providers need to be asking screening questions and performing assessment tools for proper diagnosis of tongue/lip-tie in relation to breastfeeding difficulty (Ingram, et al., 2015).

Quality of care provided in infancy, specifically regarding breastfeeding through at least 6 months of life, has been proven to lead to higher quality of life by providing optimal nutrition for human growth and development (World Health Organization, 2017). This quality improvement project aligned with the purpose and desired goals of the practice, to best serve a demographic that requires significant guidance and support.

### **Significance of Findings**

The increase in breastfeeding difficulty screening by providers during project implementation was notable. Also, of consequence, was the positive feedback from providers on the dissemination of literature and evidence-based practice recommendations regarding the



impact of tongue/lip-tie on breastfeeding difficulty. Providers in this practice have been enabled to better detect frenulum tethers and their severity, as well as determine how to proceed in order to prevent breastfeeding cessation as an effect of the tie. The procession of screening with questions investigating breastfeeding difficulty, use of Bristol Tongue Assessment Tool (BTAT) and Murphy maneuver, then referral or intervention with lactation or ENT should increase with further practice and consistency (Ingram, Johnson, Copeland, and Churchill, 2015). Provider confidence will continue to grow with increased screening and examinations, leading toward more consistent practices (AAP, 2017).

Further implications are that practitioners in the pediatric setting need increased education and practice with breastfeeding support. The pediatric providers should see themselves as some of the most influential in the success of breastfeeding (AAP, 2017). Their influence on infant care should encompass as vital a topic as breastfeeding and hinderances to success. Pediatric residencies and clinicals should include curriculum on breastfeeding and training with breastfeeding specialists to best prepare pediatric providers (AAP, 2017). Though these pediatric providers are likely to be the most influential of breastfeeding success in this community it would be helpful to them to understand and utilize their interdisciplinary resources such as ENT surgeons and lactation consultants. The collaboration between these pediatric caregivers could produce a more efficient process for making sure breastfeeding infants are able to continue successfully.

### **Project Strengths and Limitations**

As the project design came together and was implemented there were aspects that could have been conducted differently for the betterment of the project or that could have hindered the project. The participation of a cardinal provider of the pediatric practice, the site champion, in the project from design to finish was substantial regarding gaining trust and buy-in from all

practice providers. The willing engagement of lactation consultants and a trusted ENT surgeon in the discussions about lingual/labial-tie with the project director and pediatric providers had a positive influence on the impact of the project. A limitation was the amount of time available for implementation, skills training, and reiteration of information to providers. Also, there were varying amounts of interest between each provider on breastfeeding education and support, leading to different levels of enthusiasm in learning new assessment skills.

The BTAT came into question by one pediatric provider as a validated tool in pediatric practice. This was a pertinent question considering there are typically other tools like Hazelbaker Assessment Tool for Lingual Frenulum Function (HATLFF) and The LATCH Breastfeeding Assessment Tool (LATCH) that are more widely known. The BTAT had not been used in the U.S. at the time of presentation but had been utilized in Great Britain and New Zealand (Ingram, Johnson, Copeland, & Churchill, 2015).

Another limitation was the lack of knowledge of and use of the Murphy maneuver by pediatric or specialty providers. None of the providers approached about the use of this maneuver were familiar with the maneuver or able to demonstrate the exam for simulation and practice. The only way to be consistent in practice, was to follow the description of the maneuver, written out by the pediatrician who defined the exam. There were videos online for public viewing of how to perform the maneuver, but none were on valid sites. The consensus between pediatric providers and project director was to practice the Murphy maneuver exam by following the written description, to generate consistency of performance.

There were some limitations involving the collaboration of varying disciplines. The schedules of each provider and of the project director were difficult to manage, however, the project site champion and director were able to coordinate with the ENT surgeon enough to

watch a frenotomy from analgesia induction to breastfeeding in-office through the coordinating effort.

### **Project Benefits**

As a result of this project on the micro level, a local community pediatric office is more aware of the impact tongue and lip tie can have on breastfeeding success. The larger impact will be an increased number of infants in the community who are breastfed through 6 months of age due to thorough screening, education, and support. Also, mothers will benefit from the enhanced bonding via breastfeeding during successful breastfeeding efforts. As screening for breastfeeding difficulties increases the interventions improving breastfeeding success will become more prevalent and will prevent early cessation with more frequency. Prevention of early cessation means more effective breastfeeding experiences and healthier youth in the community.

### **Recommendations for Practice**

Practice change for pediatrics and other health care settings is inevitable as reimbursement, demographic, and global healthcare initiatives. As the push for exclusive breastfeeding for infants up to 6 months of age continues the need for more data on how tongue and lip-tie are best assessed for prompt detection is prominent. Also, data discussing the timeframe regarding when tongue/lip-tie are diagnosed and repaired in order to best prevent early cessation of breastfeeding is needed to help providers understand the importance of swift diagnosis and intervention. There should be more discussion between pediatric providers and specialists to align on how to approach breastfeeding success and the potential obstacles that need assessment, such as tongue/lip-tie (Ingram, Johnson, Copeland, & Churchill, 2015). The correlation between labial and lingual frenulum ties and potential breastfeeding difficulty needs positive attention from reliable sources, such as researchers, clinicians, and mothers who have

experienced this difficulty. According to Walsh and Tunkel (2017), more emphasis needs to be placed on the grading of frenulum tethers and treating based on grading in order to guide best practice and create standardized care. Also, the importance of performing the breastfeeding difficulty screening within the infant's first few visits is vital as Sharma and Jayarai (2015) discuss in their study about correcting frenotomy tethers prior to 30 days for prevention of early breastfeeding cessation.

### **Final Summary**

The process of observing the needs of a practice and community, deeming a specific need a priority, and designing a quality improvement project to address that need has been empowering and enlightening. The implementation of the designed project proved how challenging culture and practice change is, but also, how rewarding it can be when peers and colleagues appreciate being a part of the dissemination of evidence-based practice. As health care continues to grow, shift, and evolve, clinicians have to be adaptable to move with the system, influence the system, and design the change for best patient care. Advanced nursing programs encouraging and teaching the skills of observation, recognition, consideration and implementation of best practice create a well-rounded clinician able to move with the momentum of medicine as well as enhance care with colleagues and for patients.

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## Appendix A

## GUIDING BREASTFEEDING AND BREASTFEEDING DIFFICULTY FOR INFANTS UP TO 6 MONTHS:

**Breastfeeding Successfully** – *Encourage breastfeeding as best source of nutrition at least until infant is 6 months of age, and preferably until 12 months of age, with pumping if possible, when returning to work to maintain milk supply. Encourage utilization of Lactation Consulting at Vidant Children's Hospital as needed. Document mother's intent and desire to Breastfeed as well as education provided.*

**Breastfeeding Difficulty** (indicated by Abnormal Weight Loss, Unexplained/Unresolved Reflux, or Failure to Thrive) – **Ask 3 Questions:**

1. Do you feel baby is latching well to both nipples?
2. Do you hear suckling when baby is latched?
3. Are you having nipple ulceration or bleeding?

*If any of the above questions have abnormal responses perform BTAT:*

Bristol Tongue Assessment Tool (BTAT)			
Elements	0	1	2
Tongue tip appearance	Heart shaped	Slight cleft / notched	Rounded
Attachment of frenulum to lower gum ridge	Attached at top of gum ridge	Attached to inner aspect of gum	Attached to floor of mouth
Lift of tongue with mouth wide (crying)	Minimal tongue lift	Edges only to mid- mouth	Full tongue lift to mid-mouth
Protrusion of tongue	Tip stays behind gum	Tip over gum	Tip can ascend over lower lip

*If BTAT score is < 4 refer for a frenotomy/second opinion by ENT.*

*If BTAT score is > 4 but < 8 perform Murphy Maneuver finger sweep to assess for posterior frenotomy and refer to Lactation Consulting for further assessment.*

*If BTAT score 8, still refer to Lactation Consulting due to reported difficulties breastfeeding.*

**Please document if education was given, the BTAT and/or Murphy Maneuver were used, and/or referral to Lactation or ENT under ICD 10 Diagnosis Codes:**

**Ankyloglossia Q38.1 or Congenital Anomaly of Lip Q38.0**

**Low Weight Gain (Newborn) P92.6**

**Underweight (Infant) R63.6**

**Feeding Problems (Newborn) P92.9**

**Unresolved Infantile Reflux K21.9**



## Appendix B

### 1. Medical Records Review Tool

Records Reviewed	Asked Questions	BTAT	Murphy Maneuver	Referral
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				

### Appendix C

Chart 1. Number of Included Infant Charts Reviewed Between September 2018-December 2018

Number of Infants Aged 1 day to 1 month	Number of Infants Aged 1 month to 6 months
<b>81</b>	<b>26</b>

Chart 2. Referral Recommendations based on BTAT scoring and Murphy maneuver oral exam

REFER to ENT	REFER to LACTATION CONSULTING
If BTAT score < 4 <i>or</i> Murphy Maneuver oral exam findings positive for posterior lingual frenulum tightening or blanching	If BTAT score > 4 but < 8 <i>and</i> no posterior lingual frenulum tether is found with Murphy Maneuver oral exam
If BTAT score > 4 but < 8 <i>and</i> Murphy Maneuver oral exam findings positive for posterior lingual frenulum tightening or blanching	If BTAT score = 8 <i>with</i> reported breastfeeding difficulties
If labial tie is observed with oral exam	If breastfeeding difficulties are reported with request for further instruction/support